

In claims 2 and 10 at line 1, delete "1" and substitute therefore -- 19 --.

Remarks

Claims 1-3, 5-12 and 13-18 are currently pending in the application, an oral election, with traverse, having been made to withdraw claims 4 and 13 from prosecution. Applicant respectfully traverses the election/restriction requirement imposed by the Examiner. It is respectfully submitted that independent claim 1 and newly submitted claim 19 that has been substituted for claim 1 as well as dependent claim 2 are generic to both the elected species (metal) as well as the orally non-elected species (polymer, copolymer or mixtures of polymers). There is no element in claims 1 or 2 that would limit Applicant to a claim to only a metallic species. In point of fact, claim 2 specifically provides that the multi-void can be polymeric or metallic. It is therefor respectfully submitted that the restriction requirement imposed by the Examiner is improper and should be withdrawn.

Thus, claims 1- 18 remain pending in the application for purposes of the arguments submitted herewith.

Claims 1-3 and 5-8 stand rejected under 35 U.S.C. 102(b) or 102(e) as being anticipated by one or more of the following U.S. Patents: U.S. 3,672,022 to York; U.S. 5,039,567 to Landi; U.S. 5,028,474 to Czaplicki; U.S. 3,638,573 to Campbell; and U.S. 6,371,201 to Evans. It is Applicant's position that none of these references teach the invention claimed in the instant application.

As used in the art, and as specifically described in the present application (see page 5), the term “multi-void” refers to and is meant to refer to a structure of the type shown in Figure 1 and described more fully at page 4, lines 22-23 as including “voids 18 interspersed with stiffeners 20”. Such an interpretation is further supported by the disclosure at page 5, lines 4 –page 6, line 4 wherein the methods used in the fabrication of the multi-void is described in accordance with various extrusion techniques all of which are intended to produce long lengths, i.e. “continuous” lengths (see page 8, line 12). As a further indication of the properties of the multi-void core of the products of the present invention, reference is made to page 7, lines 5-8 of the specification wherein the preferred starting structure multi-void is stated to be “bendable”. Thus, there is ample evidence in the disclosure of the present application to support the language currently in new claim 19 that the multi-void core include parallel, longitudinal channels as these are not only what is depicted in Figure 1, but the inherent product of the various methods suggested for the manufacture of the multi-void core. It is respectfully submitted that the language introduced into new claim 19 merely expresses explicitly what was already inherent in the use of the term “multi-void” in originally submitted claim 1.

In reviewing the many prior art references presented by the Examiner in support of the 102(b) and 102(e) rejections alluded to hereinabove, it is clear that many of them describe “honeycomb” cores (Landi, Campbell and Czaplicki) and one describes a “wire core”, none describe a multi-void core as described in the application and now claimed explicitly in new claim 19.

As to the final reference, Evans, this reference describes a heat exchanger tube coated internally and externally, not with a “composite stiffening” layer, but rather with a “composition cladding”, a magnesium alloy, for purposes of permitting “fluxless brazing” of heat exchanger assemblies. In fact, Evans specifically introduces “dimples” 20 to “improve strength”.

In view of the foregoing, it is respectfully submitted that rejection of claims 1-3 and 5-8 under 35 U.S.C 102(b) or 102(e) is improper and that the rejection upon these bases should be withdrawn. Additionally, since this constitutes the only basis for the rejection of these claims and all other claims in the application are dependent directly or indirectly thereon, it is also respectfully submitted that all claims currently in the application stand in condition for allowance. However, in the interest of completeness, argument is submitted below overcoming the other bases for rejection of dependent claims 10-12 and 17-18. It is noted that no specific basis of rejection of claim 9 has been presented. Applicant assumes that this was an oversight, but cannot meet a non-existent rejection.

Claims 10, 11, 14 and 15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Czaplicki. As already argued above, Czaplicki basically describes a honeycomb structure which is not a “multi-void” in either the conventional sense of this term as used in the art or in the sense described specifically in the instant application and as now clearly presented in newly

submitted claim 19. It is therefore respectfully submitted that rejection of the recited claims in view of this reference is improper and should be withdrawn.

Claims 10-12 and 14-17 stand rejected under 35 U.S.C.(a) as being unpatentable over Campbell or Evans. As previously argued above, Campbell teaches a honeycomb structure which is clearly distinguishable from the "multi-void" structure of the present application and furthermore clearly patentable thereover, as it is only with the teachings of the instant application before him/her that the skilled artisan would look to either of these references to find the "stiffened multi-void" structure disclosed and claimed in the present application. Evans on the other hand does not teach the use of a stiffening layer applied to the planar surfaces of a multi-void, but rather the application of a composition layer intended to improve the brazing characteristics of his product when fabricated in a brazing oven. It is therefore again respectfully submitted that rejection of the claims of the instant application on the basis of Campbell or Evans is improper and should be withdrawn.

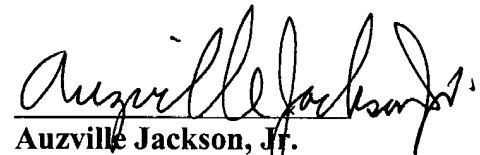
Claims 18 stands rejected under 35 U.S.C. 103(a) as unpatentable over Evans taken with U.S. Patent No. 6,245,425 to McCullough. While it is admitted that McCullough teaches an aluminum matrix composite material that incorporates ceramic fiber, it is respectfully submitted that the combination of this teaching with the teachings of Evans to the effect that a tube can be coated with a composition to improve the brazing characteristics thereof can only be made in an attempt to find

some reason to for finding that the instantly claimed invention is old, i.e. 20:20 hindsight. There is no suggestion in Evans to use anything but a magnesium containing composition to improve the brazeability of his structure. There is no suggestion in either Evans or for that matter McCollough to apply the metal matrix composite materials of McCollough to a structure such as described in Evans for any purpose. Accordingly it is respectfully submitted that rejection of these claims on the basis previously described is clearly improper and should be withdrawn.

It is respectfully submitted that in view of the amendments and arguments presented hereinabove all claims in the application are allowable. Accordingly, allowance of all claims currently in the application is respectfully requested at an early date.

“Clean” and “Marked up” copies of all pages of the application subject to change by virtue of entry of the foregoing amendments are enclosed herewith.

Respectfully submitted,

  
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**Marked-Up**

**What is claimed is:**

**[1) A composite sandwich comprising:**

**A) a multi-void core having at least two planar surfaces;  
and**

**5 B) layers of composite stiffening material attached to said  
at least two planar surfaces.]**

**2) The composite sandwich of claim [1] 19 wherein said multi-void core  
comprises a member selected from the group consisting of polymers and  
10 metals.**

**3) The composite sandwich of claim 2 wherein said multi-void core is  
fabricated from aluminum, copper or alloys of aluminum or copper.**

**15 4) The composite sandwich of claim 2 wherein said multi-void core is  
fabricated from a polymer, copolymer or mixture of polymers.**

**5) The composite sandwich of claim 2 wherein said multi-void core  
comprises an extrusion.**

**20 6) The composite sandwich of claim 2 wherein said layers of composite  
stiffening material comprise a member selected from the group consisting  
of metal matrix and polymer matrix composites.**

## Marked-Up

- 7) The composite sandwich of claim 6 wherein said layers of composite stiffening material comprises a metal matrix composite.
- 5      8) The composite sandwich of claim 2 wherein said core comprises an aluminum or aluminum alloy extrusion, and said layers of composite stiffening material comprise an aluminum metal matrix composite.
- 9) The composite sandwich of claim 8 wherein said aluminum metal matrix composite includes continuous ceramic fibers or ceramic particles.
- 10      10) The composite sandwich of claim [1] 19 wherein said multi-void core comprises a micro, multi-void.
- 15      11) The composite sandwich of claim 10 wherein said multi-void core comprises a member selected from the group consisting of polymers and metals.
- 12) The composite sandwich of claim 11 wherein said multi-void core is fabricated from aluminum, copper or alloys of aluminum or copper.
- 20      13) The composite sandwich of claim 11 wherein said multi-void core is fabricated from a polymer, copolymer or mixture of polymers.

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14) The composite sandwich of claim 11 wherein said multi-void core comprises an extrusion.

5        15) The composite sandwich of claim 11 wherein said layers of composite stiffening material comprise a member selected from the group consisting of metal matrix and polymer matrix composites.

10       16) The composite sandwich of claim 15 wherein said layers of composite stiffening material comprises a metal matrix composite.

15       17) The composite sandwich of claim 11 wherein said core comprises an aluminum or aluminum alloy extrusion, and said layers of composite stiffening material comprise an aluminum metal matrix composite.

18) The composite sandwich of claim 17 wherein said aluminum metal matrix composite includes continuous ceramic fibers or ceramic particles.

19) A composite sandwich comprising:

20        A) a multi-void core having two planar surfaces and  
including a plurality of continuous, parallel,  
longitudinal channels; and



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**B) at least one layer of a composite stiffening material**  
**attached to each of said two planar surfaces.**

**Marked-Up****Abstract**

**A composite structural sandwich comprising a multi-void core having layers of a stiffness imparting composite material attached to both planar surfaces thereof.**

**5 According to specifically preferred embodiments of the present invention, the multi-void core comprises an extruded metallic or polymeric material and the layers of stiffness imparting composite material comprise a metal matrix composite.**

**According to a further preferred embodiment the metal matrix composite includes ceramic fibers or particles. A yet further highly preferred embodiment of the**

**10 present invention utilizes a micro, multi-void extrusion as the core of the composite structure.**

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